8908-15-35

NUS CORPORATION
A Halliburton Company

SDMS DocID 2198384

ORIGINAL (Red)

[redacted]

Inventory of Known Hazardous Waste

FIELD INVESTIGATION TEAM ACTIVITIES AT UNCONTROLLED HAZARDOUS SUBSTANCES FACILITIES — ZONE I

NUS CORPORATION
SUPERFUND DIVISION

ORIGINAL
(Red)

SECTION 3

Inventory of Known Hazardous Wastes

Generated by, or known to exist on the
premises of, the Baltimore Plant

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T-6405 TMOA WASTE

	5/14/84	5/15/84
Methyl Aceate	7.3 %	7.3 %
Methanol	58.3 %	60.3 %
Acetonitrile	6.0 %	6.1 %
TMOA	ND	ND
Trimethyl triazine	0.8 %	0.7 %
Chlorotoluene *	26.1 %	25.0 %
Chloroform *	40 ppm	45 ppm
Carbontetrachloride *	2243ppm	2317ppm
Benzene *	23 ppm	24 ppm
Toluene *	61 ppm	61 ppm
Chlorobenzene *	34 ppm	34 ppm
Methylenechloride *	ND	ND

WASTE METHANOL

	5/14/84
Isoprene / Heptane	55 %
Methyl Acetate	1.4 %
Methanol	42 %
Methylenechloride *	28 ppm
Chloroform *	115 ppm
Carbontetrachloride *	5109 ppm
Benzene *	270 ppm
Toluene *	822 ppm
Chlorobenzene *	853 ppm

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2ND BASIN OIL P-2208

	5/14/84	5/16/84
7-H	0.5 %	1.0 %
ONP	35.7 %	32.1 %
Claisen	1.2 %	0.3 %
Isobutenyl	19.9 %	19.0 %
ONPME	1.5 %	6.7 %
7-Nitro	40.5 %	36.9 %
Tars	4.8 %	5.0 %
2-chlorophenol *	2690ppm	2303ppm

3RD BASIN OIL P-1205

	5/14/84	5/16/84
7-H	6.2 %	6.0 %
ONP	3.4 %	3.5 %
Claisen	4.7 %	4.5 %
Isobutenyl	4.6 %	4.5 %
ONPME	61.1 %	59.5 %
7-Nitro	11.7 %	12.1 %
Tars	4.3 %	5.0 %

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CLAISEN TAR P-2235

	5/14/84	5/16/84
ONPME	4.3 %	52.1 %
Tars	5.8 %	29.4 %
2,4-Dinitrophenol*	ND	165 ppm
4-Nitrophenol *	ND	780 ppm

Indications from the analytical data are that the sample taken 5/14/84 is mostly oil diluent.

SUPER TAR P-2236

	5/14/84	5/16/84
ONPME	15.8 %	34.9 %
Tars	55.8 %	44.0 %
2,4-Dinitrophenol *	123 ppm	217 ppm
4-Nitrophenol *	840 ppm	992 ppm

Added to original

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COOLING TWR SLUDGE

Components %	Sample Method Frequency	Test Method
30-60 Algae Residue	Grab/1/Yr.	
1 ~~Chromate~~ ION		1-M
500 ppm Zinc ION		1-M
Balance Water		

original

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7-HYDROXY TAR

Components %	Sample Method Frequency	Test Method
100	Grab/1/6 months	F-V-9

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7-OH TAR ANALYSIS

C. A. Shaheen

The residue of 7-Hydroxy distillation where the 7-hydroxy is manufactured from ONP consists of dimer, trimers, tetramers and higher numbers of repeating units of the following basic building blocks (monomeric units).

(1) 2,2 Dimethyl - 2,3 - dihydrobenzofuranol

(2) 2,2 Dimethyl - 2,3 - dihydrobenzofuran

(3) Xylene

(4) 2,2 - Dimethyl - 2,3 - dihydro - 7 - amino benzofuran

90% of all tars analyzed are dimers and trimers of the 1st two compounds.

G.C. volatile compounds have been identified to a molecular weight of ~450. Non- G.C. volatile compounds are assumed to be tetramers, pentamers and higher number repeating units of rapidly diminishing concentration.

Two other tars of the 75% identifiable by gas chromatograph do not fit the above description. They are:

3% 2,2 - Dimethyl - 2,3 - dihydro - 3 - Keto benzofuranol

2% 2,2 - Dimethyl - 2,3 - dihydro - 3 - hydroxy benzofuranol

Added

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7-OH TAR PLANT # 1

	5/15/84	5/16/84
7-OH	2.4 %	2.3 %
Tars	51.2 %	46.6 %

7-OH TAR PLANT # 3

	5/14/84	5/16/84
7-OH	2.2 %	5.2 %
Tars	85.1 %	84.6 %

Added

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MAC WASTE

	5/14/84 T-1141	5/16/84 P-1142
IB	0.2 %	0.2 %
TBC	0.04%	.04%
ICC	1.5 %	1.7 %
MAC	6.3 %	5.2 %
DCIB (1)	45.4 %	49.2 %
DCIB (2)	32.4 %	33.2 %
TCIB (3)	14.1 %	13.4 %

DCIB (1) = 1,2-dichloro-2-methylpropane or dichloroisobutane

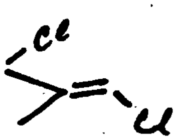
DCIB (2) = 3-chloro-2-chloromethyl-1-propene and
(cis/trans) 1-chloro-2-chloromethyl-1-propene

TCIB (3) = 1,2,3-trichloro-2-methylpropane

Added

DClB(2)

3-chloro-2-chloromethyl-1-propene



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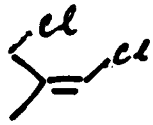

(cis/trans) 1-chloro-2-chloromethyl-1-propene

DClB(1)

1,2-Dichloro-2 methyl-propANe

Added

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WASTE METHANOL

Components %		Sample Method Frequency	Test Method
65-75	MeOH	Grab/1/6 month	DVE-1
2-4	TMOA		
1-2	MeAc		
4-6	Heptane		
$\leq$1	Isoprene		
$\leq$1	H_2O		
$\leq$1	FMC 30098 " 39338		

original

DVE

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STEP I BOTTOMS

Components %	Sample Method Frequency	Test Method
10-30 FMC 30098 30-60 FMC 30085 10-15 TMOA	Grab/1/6 months	DVE-1

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4/26/85 CAS

CHLOROACETYLENICS

Composition	90
DV Ester	30 - 33
Heptane	25 - 30
Chloroacetylenics	25 - 30
Methyl Benzoate	5 - 10

Abaed

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MDD003071875

CAS 12/28/83

C-1 Chemical and Physical Analysis (Update)

TMOA WASTE ORGANICS

Composition	%
Methanol	30-35
O-Chlorotoluene	30-35
Trimethyl-O-Acetate	12-14
Methyl Acetate	5-7
Sodium Chloride	1-2
Acetonitrile	1-2
Methyl Chloride	5-6
Acetamide	1-2
Sodium Methoxide	1.0

RCRA Classification - D001 - Ignitable Liquid

Added

ORIGINAL
(RED)

MDD003071875

CAS 12/28/83

C-1 Chemical and Physical Analysis (Update) (continued)

TMOA - Waste Filter Cake

Composition	%
Ammonium Chloride	75-80
Sodium Chloride	15-18
O-Chlorotoluene	6-8
Methanol	1.0
Trimethyl O-Acetate	1.0
Acetonitrile	10 ppm - 12 ppm

RCRA Classification - D001 - Ignitable Solid

Added

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DVE

STEP III BOTTOMS

Components %	Sample Method Frequency	Test Method
10-20 FMC 39338 10-20 FMC 30094 10-20 Trichloroproducts of FMC 30094 5-10 Methyl 3 Benzene 2,2 dimethylcyclopropane carboxylate Balance - polymers of FMC 39338	Grab/1/6 months	DVE-3

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STEP III HEAD CUT

Components %	Sample Method Frequency	Test Method
40-50 FMC 39342 10-20 FMC 39338 10-15 Methyl Benzoate 25-40 FMC 39338 Analogs	Grab/1/6 months	DVE-3

original

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STEP II

Components %	Sample Method Frequency	Text Method
80-85 CCl_4 10-12 MeOH, MeAc, Isoprene 0-5%Chloroform TR - Methyl prenyl ether TR - Chlorobenzene	Grab/1/6/months	DVE-2

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DV ESTER BRINE

Components %	Sample Method Frequency	Test Method
10-15 NaCl	Grab/1/Month	#285
.1-.3 MeOH	" "	
.1-.2 Heptane	" "	DVE-3
.2-.5 polymers of FMC 39338	" "	
≤100 ppm CCl_4		WW-2
Trace Na_2HPO_4		Standard Method 424
Balance - H_2O		

Original

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SPENT CARBON

Components %	Sample Method Frequency	Test Method
.1-.5 CCl_4	Grab /1/6/month	DVE-2adapted
.1-1 Heptane	" "	
1-2 MeOH	Grab/1/6 month	
TR-FMC 30098		
" 39338	" "	WW-3 adapted
" 30099	" "	
Balance Carbon	" "	

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COPPER SLUDGE

Components %	Sample Method Frequency	Test Method
10-20 Na_2SO_4	Grab/1/6 month	FMC - P-100
1-3 $Mg(OH)_2$, NaOH		
1-10 CuO		
.1-.3 Xylene		ASTM (D 1067) 31
3-6 polymerized benzofuranols		FMC-M-1
Balance H_2O		

original

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BASIN SLUDGE

Components %	Sample Method Frequency	Test Method
60-70 Water 12-18 $7NO_2$ 10-15 Isobutenyl 1-5 Isobutyl 1-5 Inorganic Salts Balance Polymerized Tars	Grab/1/Yr.	P-100 adapted

what basin sludge is this?

original

ORIGINAL
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SODIUM BROMIDE

Components %	Sample Method Frequency	Test Method
5-15 NaDTA		FMC - 30.1
25-35 NaBr	Grab/1/6 month	FMC - 30.7
50-70 H_2O		
50-75 ppm Ethion		FMC - 30.7

original

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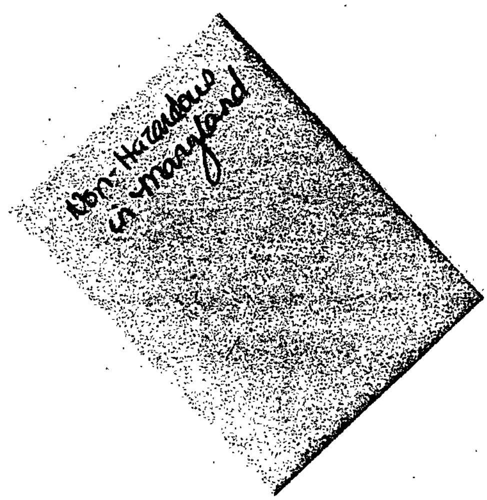
ASBESTOS INSULATION

Components %	Sample Method Frequency	Test Method
100 Asbestos	Grab/1/Yr.	ASTM (D-628) 33



original

INAL
(RED)

7 NO_2 BOTTOMS

Components %	Sample Method Frequency	Test Method
30-50 $MgCl_2$ 50-70 7 NO_2 .5-.8 ONP	Grab/1/6/months	Filtration F-II-B-8

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(RED)

CONTAMINATED LAB GLASSWARE

Components %	Sample Method Frequency	Test Method
90-95 Glass 5-10 Plastic Caps .5-1 Various DHS	Grab/As required	Source determined

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ORIGINAL
(RED)

7-NITRO SPILLAGE

Components %	Sample Method Frequency	Test Method
90-93 $7NO_2$	Grab/1/6 months	
1-4 Claisen	" "	F-IIB-8
1-4 Isobutenyl	" "	"
0-1 ONP	" "	"

original

ORIGINAL
(RED)

BASIN LIQUID

Components %	Sample Method Frequency	Test Method
40-50 ONPME	Grab/1/Yr.	F-IIB-1
2-5 ONP	" "	"
10-40 Water	" "	"
10-20 $7NO_2$ Tars	" "	"
10-20 Sand, Dirt, Carbon		Filtration

original

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ONP SPILLAGE

Components %	Sample Method Frequency	Test Method
5-10 ONP 90-95 Dirt/Gravel	Grab/As Required	FRM-I-1 Filtration

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(RED)

P_2S_5 SWEEPINGS

Components %	Sample Method Frequency	Test Method
75-90 P_2S_5	Grab/1/Yr.	Monsanto #12,389 or Outside Lab
10-25 Dirt/Sand		Filtration

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EMPTY POUNCE DRUMS

Components %	Sample Method Frequency	Test Method
< .1 Pounce		Pounce - 1
90-92 C.S. Drum	Grab/As Required	
8-10 Liner		

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ALLYL ALCOHOL/ETHER

Components %	Sample Method Frequency	Test Method
80-95 Diallyl Ether 4-10 Allyl Alcohol remainder H_2O	1/transfer to incinerator	G.C.

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MONOMERS RESIDUE

Component %	Sample Method Frequency	Test Method
95 Diallyl Phthalate (DAP) or 95 Diallyl Isophthalate (DAIP) or 95 Diallyl Maleate (DAM)	1/transfer to incinerator	FMC - 23 G.C.

remainder DAP, DAIP, or DAM polymers

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OIL B

Component %	Sample Method Frequency	Test Method
80-90 Dithioic esters remainder Dithioic salts	grab/as required	FMC - 30.5

Original

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(RED)

POUNCE ORGANICS

Component %	Sample Method Frequency	Test Method
70-80 MeOH 10-20 n-Octane remainder H_2O + HCl	1/transfer to incinerator	FMC - Pounce - 7

Original

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(RED)

CYPERMETHRIN STEP I WASTE

Components %	Sample Method/Frequency	Test Method
NaCl 10-15	Grab-1/campaign	FMC - FRM - 40
MeOH 5-10		G.C. A%
FMC 30062 800-1500 ppm		FMC - CYP - 1
FMC 39338 1300-2000 ppm		FMC - CYP - IV-B
Water - Balance		ASTM (D-2777) 31

Added

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CYPERMETHRIN STEP II WASTE

Components %	Sample Method/Frequency	Test Method
NaCl 3-6	Grab-1/campaign	FMC - FRM -40
Na_2SO_3 10-15		Outside Lab
Na_2SO_4 1-2		Outside Lab
NaOH 0-1		FMC - 285
Heptane 30-50		FMC - CYP - 1
DV Acid Chloride 1-5		FMC - CYP - III-B

Added

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CYPERMETHRIN STEP III WASTE

Components %	Sample Method/Frequency	Test Method
NaCN 1-3	Grab-1/campaign	STD Method 412B
NaCl 10-15		FMC - FRM - 40
Na_2CO_3 5-10		ASTM - (D513) 31
FMC 51055 3-8		FMC - CYP - IIIB
Cypermethrin 500-800 ppm		FMC - CYP - XI

Added

ORIGINAL
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CYPERMETHRIN WASTE - OIL DRY/SAMPLE JARS, MISC.

Components, %	Sample Method/Frequency	Test Method
Cypermethrin 100-800 ppm	Grab-1/campaign	FMC - - CYP - XI
NaCN 1-2		STD Method 412-B
FMC 39338 1-3		FMC - CYP - IVB
MeOH 1-3		GC A%
NaOH 0-1		FMC 285
Oil Dry - Balance		Filtration

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CYPERMETHRIN SPENT CARBON

Component %	Sample Method/Frequency	Test Method
Activated Carbon 98-99	Grab-1/campaign	Filtration
Heptane, Methanol - Balance		GC A%

Added

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CYPERMETHRIN WASTE HEPTANE

Component %	Sample Method/Frequency	Test Method
Heptane 60-80	Grab-1/Campaign	FMC - CYP - 1
DV Acid Chloride 5-10		FMC - CYP - 1
Water Balance		Karl Fisher

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CYPERMETHRIN FILTER CAKE

Component %	Sample Method/Frequency	Test Method
Filter Aid 90-98 NaCN 1-2 Cypermethrin 500-800 ppm DV Ester 300-500 ppm Heptane 0-1	Grab-1/campaign	Filtration STD Method 412B FMC - CYP - XI FMC - Pounce 4 Rev. 2 FMC - CYP -1

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CYPERMETHRIN SODIUM CYANIDE WASTE

Component %		Sample Method/Frequency	Test Method
NaCN	10-20	Grab-1/Campaign	STD Method 412B
Water	Balance		Karl Fisher

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I.C. General Inspection Requirements

All hazardous waste management areas are inspected on a daily basis for malfunctions and deterioration, operator errors, and discharges that may cause a release of hazardous waste or constituents to the environment or pose a threat to human health. A written inspection log has been developed for all hazardous waste management areas of this facility, (See Attachments). Inspections are done on a daily basis, during periods of operation or as required. These inspection logs are maintained under lock and key in the operating area and will be kept for a period of three (3) years. All inspection forms are signed and dated by the inspector. Any problem areas discovered will be remedied on a schedule which insures that the problem will not lead to an environmental or human health hazard.

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Facilities containing Hazardous Wastes

Item Number	Material	Volume (Gal.)	Location
T-203	90% Carbon Tet	3000	Bldg. 34 Area
T-353	Chloroacetylenics	1000	
T-411 (2), 412 (2), 413	Methanol	10,000 ea.	
T-440	Brine	100,000	
T-551	3% Carbon Tet	10,000	
T-556	3% Sodium Cyanide	5,000	
T-17	Isopropanol	5,000	Bldg. 91 Area
T-18	Organics	3,000	
T-23	Treated Waste Water	5,000	
T-23	" " "	5,000	
T-22	" " "	10,000	
Fire Water Pond	Pounce Contamination	38,000	
Waste Water Storage	" "	30,000	
T-21	Untreated Waste Water	10,000	
T-9273	Oil B	10,000	Building 6 Area
T-3466	Oil B	13,000	
T-3469, 3470 3471	Sodium Bromide	13,000 ea.	
T-17363, 17364	Sodium Sulfide	12,000 ea.	
T-17373	Sodium Sulfide	10,000	
T-20447	Sodium Sulfide	100,000	

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Facilities containing Hazardous Wastes

Item Number	Material	Volume	Location
V-2230, 2231, 2232	Coal Filters	8,000 ea.	N. of J. Zink Inci
Calgon Vessels (4)	Activated Carbon	9,000 ea.	Calgon Bldg. - N. o 7-OH Shop
T-600; 17183; 17184; 590; 593	Allyl Ether	10,000 ea.	Bldg. 9 Area
T-2209	7-OH Oil (Decanter)	1,160	7-OH Area
T-2203A, 2203B	Waste Organics	20,000 ea.	
T-2204A, 2204B	Waste Organics	4,300 ea.	
V-1211, 1212, 1518, 1519, 3211, 3212, 3518, 3519	7-OH Tar (Tar Receivers)	190 ea.	
V-211, 212		60 ea.	
T-1221, 1221A, 1221B 1221C, 1221D, 1221E, 1221F	Tar Buggies	150 ea.	
T-1281-3	Settling Tank	5,160	
T-2201	Waste Tar	2,500	
T-1210, 3210	Emergency Quench Pit	11,500	
Effluent Basins (3)	7-OH Tar, Ether, Xylene Sludge	101,600 Total	
Retention Basin (North and South)	7-OH Oils, Grease, Sludge	1,000,000 Total	
T-2501, 2502, 4301	Waste Water	1,500,000 each	
T-506	N. Copper Settler	50,000	
T-1827	S. Copper Settler	60,000	
T-3570A, B. C	Copper Waste Water	102,430 each	

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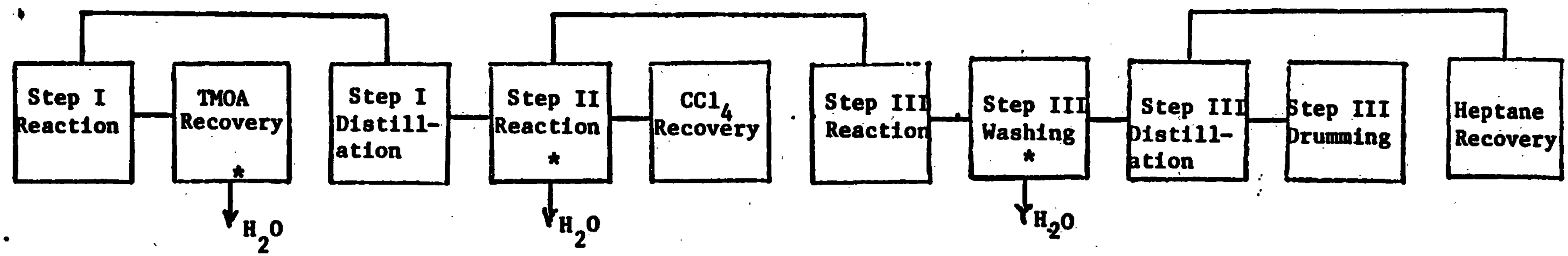
Facilities containing Hazardous Wastes

Item Number	Material	Volume	Location
T-3571	Copper Waste Water	540,000	
T-3567	Copper Sludge	10,150	
T-1723	Aqueous Waste	210	

2. BLOCK DIAGRAM



* = Potential Spill Area

1. Name - DV Ester

2. Pollution Potential - High

3. Spill Receiving System - Containment Area, Sump

4. Counter Measures - Recovery and/or Contract Disposal

5. Removal - Available

6. Reporting - Environmental Incident Report

7. Start-up/Shut-down Wastes - No S-U/S-D Wastes

8. Frequency of upsets/failures - Unknown

9. Location

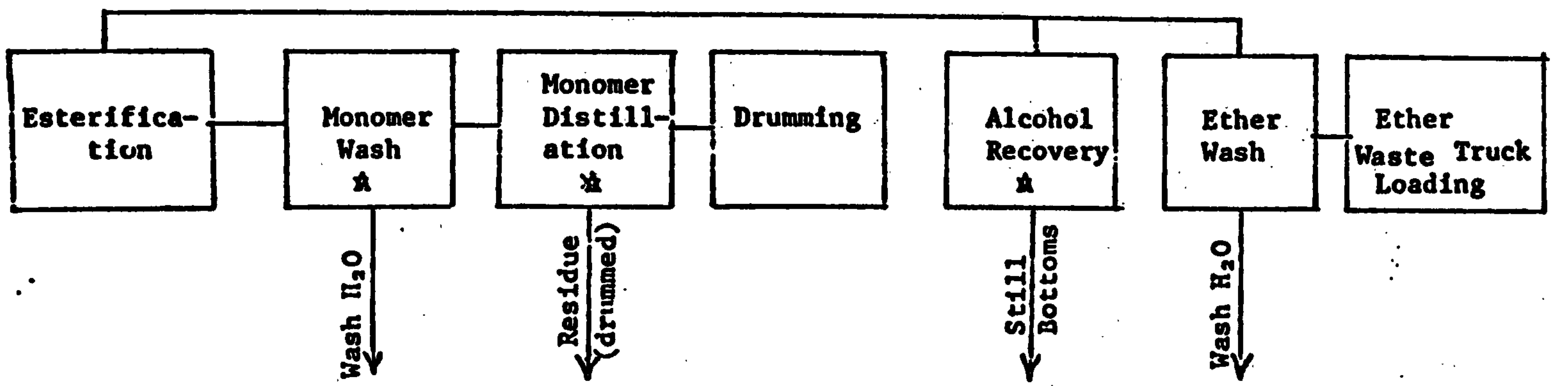
Location	Continuous	Intermittent	Infrequent
a. Pump Shafts			
b. Agitators			
c. Valve Stems			
d. Vent Systems			X
e. Sampling Prints		X	
f. Level Controllers			X
g.			
h.			

10. Inspection/Maintenance-Adequate

11. Previous Incidents -

12.

BLOCK DIAGRAM



☆ = Potential Spill Area

1. Name - Monomers

2. Pollution Potential - High

3. Spill Receiving System - WTS

4. Counter Measures - NP

5. Removal - A (If contained)

6. Reporting - Environmental Incident

7. Start-up/Shut-down Wastes No S-U/S-D Wastes

8. Frequency of upsets/failures - Unknown

9. Location:

	Continuous	Intermittent	Infrequent
a. Pump Shafts			x
b. Agitators			
c. Valve Stems			
d. Vent Systems			
e. Sampling Pts.			x
f. Vacuum jet dschg.		x	
g.			
h.			

10. Inspection/Maintenance - Adequate

11. Previous incidents -

12.

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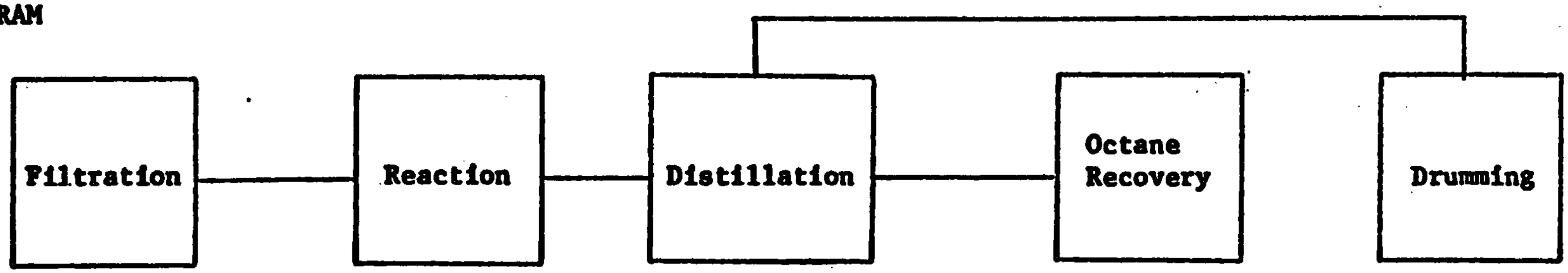
BLOCK DIAGRAM



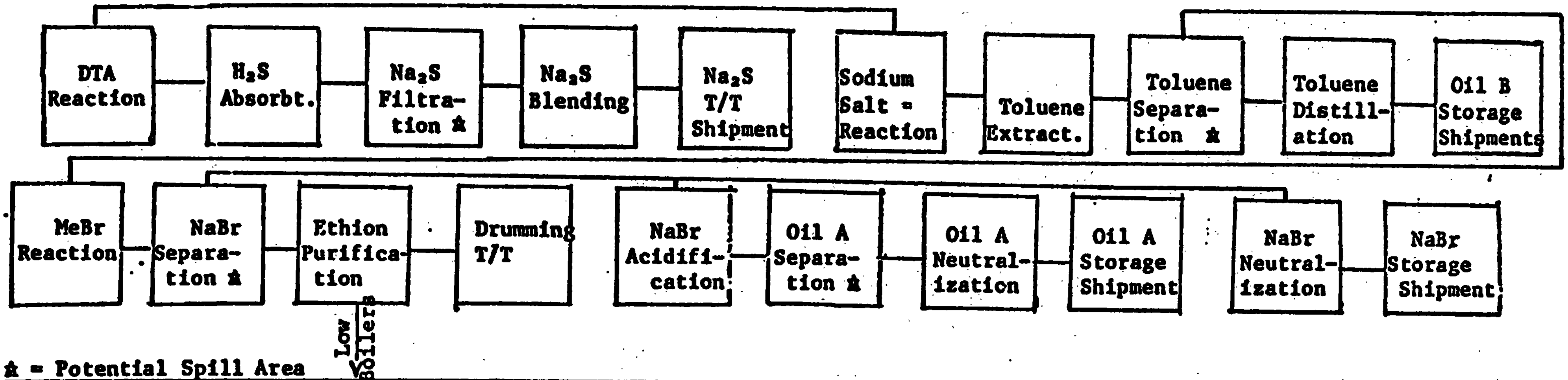
★ = Potential Spill Area

1. Name – Pounce (FMC 33297)
2. Pollution Potential – High
3. Spill Receiving System – Containment Area
4. Counter Measures – Recovery and/or Special Disposal
5. Removal – A
6. Reporting – Environmental Incident
7. Start-up/Shut-down Wastes – No S-U/S-D Wastes
8. Frequency of upsets/failures – Unknown
9. Location:

Location:	Continuous	Intermittent	Infrequent
a. Pump Shafts			
b. Agitators			
c. Valve Stems			
d. Vent Systems			
e. Sampling Pts.			
f.			
g.			
h.			

10. Inspection/Maintenance – Adequate
11. Previous incidents –
12. Comments –

ORIGINAL (RED)



☆ = Potential Spill Area

1. Name - Ethion, Sodium Bromide Recovery
   Sodium Sulfide Recovery

2. Pollution Potential - Ethion - High
   NaBr - Med.
   Na_2S - High

3. Spill Receiving System - WTS

4. Counter Measures - NP

5. Removal - A (If Contained)

6. Reporting - Environmental Incident

7. Start-up/Shut-down Wastes No S-U/S-D Wastes

8. Frequency of upsets/failures - Unknown

9. Location:

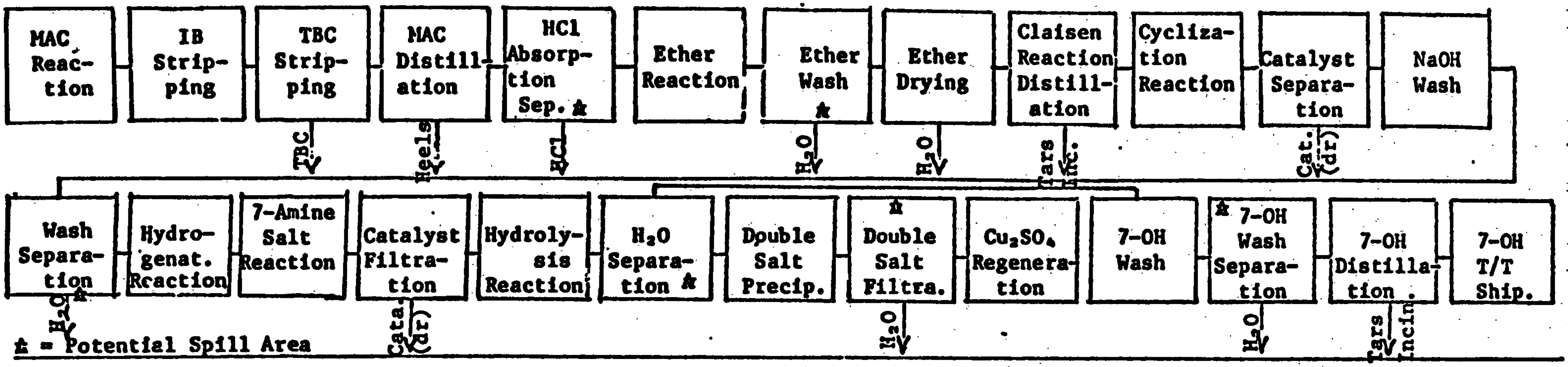
	Continuous	Intermittent	Infrequent
a. Pump Shafts			x
b. Agitators			
c. Valve Stems			
d. Vent Systems			
e. Sampling Pts.			x
f. Piping			x
g.			
h.			

10. Inspection/Maintenance - Adequate

11. Previous incidents -
    Oct. 1971, Toluene Recovery System, Unknown, 1, Effect Unknown
    Quantity (500 gals)

12.

BLOCK DIAGRAM



1. Name - 7-Hydroxy

2. Pollution Potential - High

3. Spill Receiving System - WTS

4. Counter Measures - NP

5. Removal - A (If Contained)

6. Reporting - Environmental Incident

7. Start-up/Shut-down Wastes - No S-U/S-D Wastes

8. Frequency of upsets/failures - Unknown

9. Location:

Location	Continuous	Intermittent	Infrequent
a. Pump Shafts		x	
b. Agitators			
c. Valve Stems			
d. Vent Systems			
e. Sampling Pts.			x
f. Level Controllers			x
g.			
h.			

10. Inspection/Maintenance - Adequate

11. Previous incidents -

12.

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Section 4.0 - Wastewater Treatment System

It is plant policy to operate all production units at conditions that result in the minimum discharge of pollutants in the wastewater streams. All wastewater streams from the various production units (south of Patapsco Avenue) flow to the plants' wastewater treatment facility prior to discharge into Curtis Bay. A description of this facility including appropriate maintenance and operational items are given in the following sections.

The Pounce manufacturing facility (north of Patapsco Avenue) is surrounded by curbing that directs any wastewater to a sump. The sump contents are pumped into holding tanks. No wastewater is discharged to an outfall that does not meet the NPDES permit requirements for this operation.

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Section 4.1 - Description

The waste water treatment facility is divided into two parts, the plant general and the 7-OH treatment systems. The plant general system treats the following streams:

PLANT GENERAL SYSTEM

1. Wastewater from all production units other than 7-OH.
2. Clean wastewaters from the 7-OH unit.
3. Storm water from the central plant area not including the southeast section or northern plant areas.
4. Wastewater from the 7-OH units after its specific treatment.

These streams are collected in manhole 105, neutralized in pH adjustment tank T-2505, equalized in equalization tank T-2501, contacted with acid gases from incinerator B-2201, neutralized again in the pH adjustment basin and then pumped to an underwater discharge point in Curtis Bay from the final surge basin.

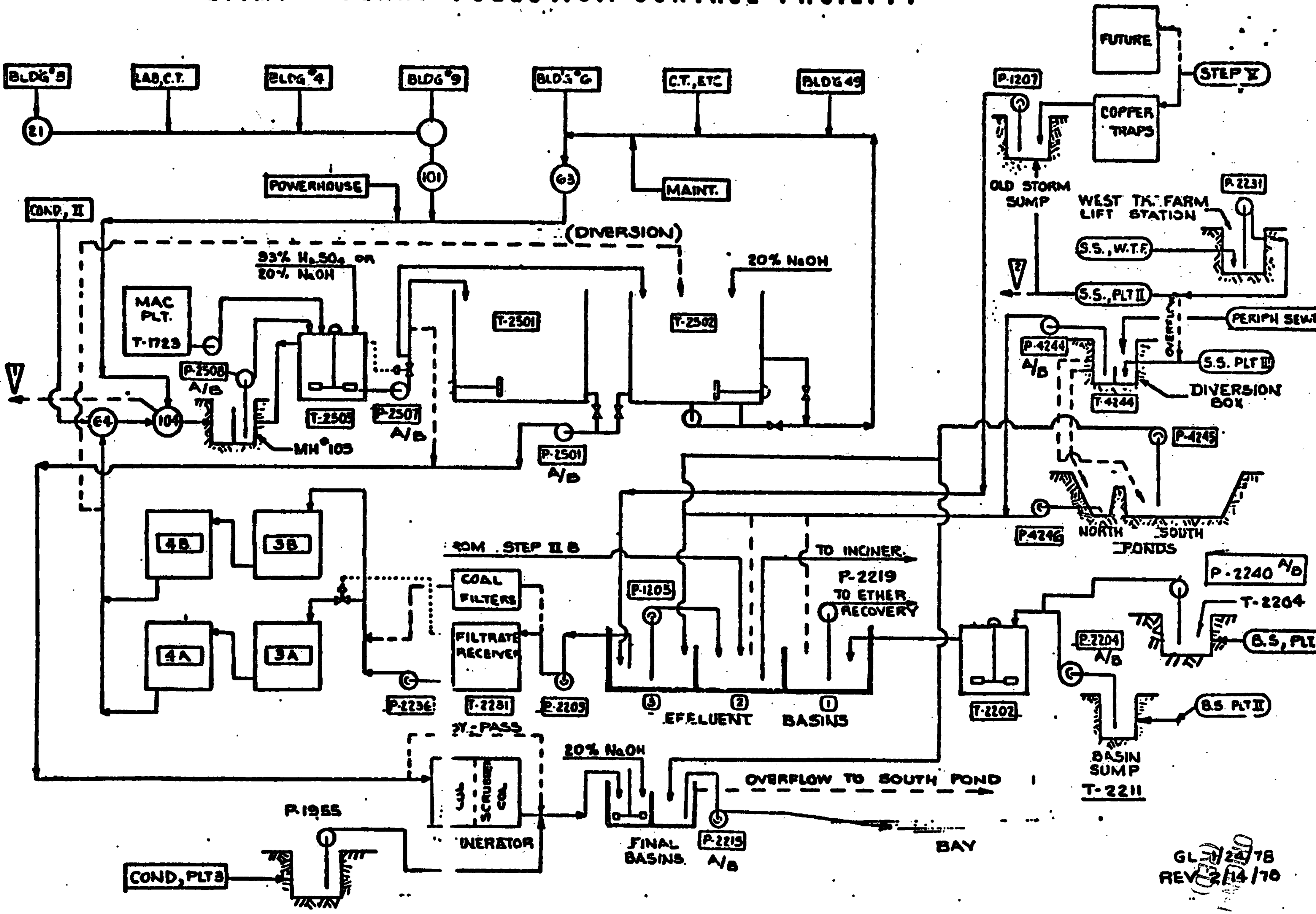
The 7-OH treatment system treats the following streams:

1. Wastewater from the 7-OH unit.
2. Storm water from the 7-OH area.

Storm waters are collected in two retention ponds. Wastewaters are collected in the basin waste lift sumps T-2211 and T-2204. Both streams are then pumped into settling basins for removal of heavy oils, treated for reduction of entrained oils and then discharged to the plant general manhole 105. Heavy oils removed by settling are burned in incinerator B-2201.

Two full time operators are required for these treatment systems. A schemetic of the combined wastewater systems is included in this section.

BALTIMORE PLANT POLLUTION CONTROL FACILITY



LEGEND

PUMP — MANHOLE — PIPE LINE — EMERGENCY — B.S. BASIN SEWERS

FMC Corporation

Agricultural Chemical Group
1701 East Patapsco Avenue Box 1616
Baltimore Maryland 21203
(301) 355 6400

FMC

FMC - Baltimore, Maryland

PLANT CLOSURE PLAN

PURPOSE: The following procedure has been prepared to comply with Resource Conservation and Recovery Act (RCRA) regulations listed 5/19/80, to become effective 5/19/81. This plan must be updated annually (and amended as required) according to procedures described in the RCRA Regulations and must be kept at the plant site at all times.

A. Standards

The facility must be closed in a manner that minimizes the need for further maintenance and controls, minimizes or eliminates to the extent necessary to protect human health and the environment, post-closure escape of hazardous waste, hazardous waste constituents, leachate, contaminated rainfall, or waste decomposition products to the ground water, or surface waters or to the atmosphere.

B. Schedule

Upon finalization of the decision to cease operation of the plant as a production or storage facility, the following must be done.

1. Submit this closure plan to the EPA Regional Administrator located at the following address:

   US EPA, Region 3
   Solid Waste Program
   6th & Walnut Streets
   Philadelphia, Pennsylvania 19106
   Phone: 215-597-9814

   This must be done at least 180 days before the expected date at which closure is to begin.

2. The above mentioned Regional Administrator will notify, approve or disapprove this plan within 90 days of receipt, and after providing FMC and the affected public (through a newspaper notice) the opportunity to submit written comments.

3. Within 90 days after receiving the final volume of hazardous waste, FMC must treat all hazardous wastes in storage or in treatment or remove them from the site or dispose of onsite in accordance with the closure plan.

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PLANT CLOSURE PLAN

Upon finalization of the decision to cease operation, the following must be performed:

1. Notify personnel of impending closure
   date____________________.

2. Cancel incoming material orders and shipments.
   Date complete____________________.

3. Terminate production
   - Schedule completion____________________.

   Ethion line date complete____________________.
   - Schedule completion____________________.

   Monomers line date complete____________________.
   - Schedule completion____________________.

   DV Ester line date complete____________________.
   - Schedule completion____________________.

   7-Hydroxy line date complete____________________.
   - Schedule completion____________________.

   Pounce line date complete____________________.
   - Schedule completion____________________.

   Arrivo line date complete____________________.
   - Schedule completion____________________.

4. Ship out products from warehouses.
   - Scheduled completion date____________________.
   - Date completed____________________.

5. Ship out, or return excess raw materials, empty containers, pallets, bags, drums, etc.
   - Scheduled completion date____________________.
   - Date completed____________________.

C. Procedure

1. Remove all hazardous waste residues from any tanks, discharge control equipment (such as dust collectors), or discharge containment structures. Place in approved containers for treatment or disposal.

2. Testing procedures and results must document the condition of the liquid (wash & waste water) surface impoundment to verify its status.

   (a) If non-hazardous no further action is necessary.

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Plant Closure Plan

(b) If test results prove the liquid a hazardous waste, all standing liquid must be pumped up and placed in drums or tank vehicles for treatment or disposal. Also, waste, waste residues, and all underlying or contaminated surrounding soil will be excavated and placed into approved disposal contianers also for treatment or disposal. as dictated by the proper authority.

3. Remove all incinerator residues (including but not limited to ash, scrubber waters and scrubber sludges) from the incinerator. Place in approved containers and test. If test results so indicate, treat the waste so as to render it no longer hazardous, or store until disposed of in an approved manner.

D. Waste Inventory

The maximum inventory of stored waste is anticipated not to exceed 600 drums, (30,000 gal. or comparable volume), placed 4 drums per pallet. The areas used for palletized waste storage may range from approximately 1000 - 5000 sq. ft. of storage area, depending upon stacking height. One storage area is located north of 7-Hydroxy Plant I and another is located east of B-34.

E. Decontamination (Part I)

1. The estimated volumes of hazardous wastes that would have to be disposed of, their disposal costs, primary and alternate disposal sites are given below.

CAS 1/28/86

Waste Description	Estimated on hand inventory	Unit Cost C ($)	Total Disposal Cost (K $)	Disposal Site
T-2501/2502/4301 Solid Residue	1,000,000 P	0.10	100	C.W.M. - N.Y.
Lab Glassware	10 D	650.00	6.5	Rollins - N. J.
DVE Brine	20,000 G	0.16	3.2	Chem-Clear, MD
DVE Step I/II/III Residues	10,000 P	0.33	3.3	Rollins - N. J.
DVE Carbon Tet	15,000 P	0.14	2.1	Rollins - N. J.
DVE/Cyp./Calgon Carbon	10 D	650.00	6.5	Rollins - N. J.
DVE Misc. Solid	10 D	88.00	.880	C.W.M. - ALA
Cyp. Wate (Aq.)	40,000 P	0.04	1.6	DuPont - N. J.
Cyp. Filter Cake	10 D	88.00	.88	C.W.M. - ALA
Cyp. - Misc. (solid)	10 D	88.00	.88	C.W.M. - ALA
Empty Cyanide Drums	100 D	48.00	4.8	C.W.M. - ALA
Sodium Cyanide Waste (Aq.)	500 G	3.00	1.5	C.W.M. - ALA
Empty Drums (Misc.)	300 D	48.00	14.4	C.W.M. - ALA
Pounce Waste (Solid)	10 D	650.00	6.5	Rollins - N.J.
DV Acid Chloride	4000 G	.19	.760	DuPont - N. J.

4a.

Waste Description	Estimated on hand inventory	Unit Cost C ($)	Total Disposal Cost (K $)	Disposal Site
Ammonium Chloride Filter Cake	80 D	77.00	6.2	GSX - S.C.
TMOA Organic Waste	20,000 P	.16	3.2	Rollins - N.J.
Copper Sludge	100,000 G	1.00	100 K	SCA - N.J.
7-Hydroxy Tar/Misc.	50 D	77.00	3.9 K	GSX - S.C.
ONP Spillage	2 D	77.00	.16 K	GSX - S.C.
7-Nitro Bottoms	50 D	77.00	3.9 K	GSX - S.C.
MAC Column Packing	80,000 P	.10	8.0 K	GSX - S.C.
Basin Sludge	200 D	230.00	46 K	C.W.M. - ALA
Sodium Bromide Waste (Aq.)	15,000 G	.55	8.3 K	SCA - N. J.
Sulfide Tank Washings	2,000 G	3.00	6.0 K	SCA - N. J.
Oil "B"	50,000 P	.19	9.5 K	Rollins - N. J.
P_2S_5 Sweepings	12 D	NO OUTLET AT THIS TIME		
Sodium Sulfide/Bromide Sludge	200 D	230.00	46 K	C.W.M. - ALA
Ethion Filter Cake	30 D	650.00	2.3	GSX - S. C.
Phthalic Anhydride Spillage	10 D	650.00	6.5	Rollins - N.J.
Cooling Tower Sludge	5 D	650.00	3.3	Rollins - N.J.
Diallyl Phthalate Waste	5 D	650.00	3.3	Rollins - N. J.
Pounce Resin	5 D	650.00	3.3	Rollins - N. J.
		GRAND TOTAL	$413,660	

D = Drums
P = Pounds

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PLANT CLOSURE PLAN

2. Prior to cleanup and subsequent decontamination all known wastes and areas suspect of contamination will be tested to determine toxicity. Areas and wastes requiring further attention will be treated in the following manner.

   a. Waste Materials

   Waste materials will be subject to treatment so as to render them no longer considered as hazardous wastes or so as to render them suitable for placement in an approved dump location.

   b. Process Equipment, Incinerator, Emission Control Equipment

   Process equipment will be decontaminated in the following manner:

   1. All equipment will be drained or emptied of all process residue. Such materials will be handled in an appropriate manner and placed in suitable containers.

   2. All equipment will be vacuumed or washed or appropriately disposed of. The wash solution will be a caustic solution or another suitable decontamination solution.

   c. Buildings

   All buildings which have been used for chemical storage or production will be checked for contamination. Those found to be contaminated will be decontaminated using current appropriate methods or razed and suitably disposed of.

   NOTE: All areas subject to decontamination activities will be subject to laboratory testing to assure that decontamination activities have been successful.
   Decontamination procedures will be repeated as required until acceptable results have been obtained.

   d. Miscellaneous Containers

   Dispose of combustible containers (usually bags) suspected to be contaminated by incineration.

   Cans or drums, suspected of contamination should be triple-rinsed using solvent (usually water) used in making up the tank mix. This operation should be performed if possible during phase-out of the production process prior to shutdown. Triple rinsing must consist of rinsing the container three times with enough solvent to equal 10 percent of the volume of the container. The container should be disposed of in a proper manner as dictated by the proper authorities.

It is further suggested that small cans or jugs (plastic or steel) be crushed or shredded if possible so as to minimize the bulk volume at the disposal site.

e. **Cost Estimate for Facility Closure**

Cost estimates have been provided by the following companies who may be used to annually update these costs.

Disposal Site Costs	Abbreviation
1. E. I. DuPont de Nemours, Inc. Chambers Works Deepwater, New Jersey 08023 Phone (609) 299-5000	DuPont, N. J.
2. Chem-Clear 1910 Russell Street Baltimore, Maryland 21230 Phone (301) 685-3910	CC
3. Chemical Waste Management, Inc. P. O. Box 55 Emelle, Alabama 35459 Phone (205) 652-9531	CWM
4. GSX Services Route #1, Box 255 Pinewood, SC 29125 Phone (803) 452-5003	GSX
5. Rollins Environmental Services, Inc. P. O. Box 221 Bridgeport, New Jersey 08014 Phone (609) 467-3100	CWM
6. SCA Chemical Service Co. Earthline Division 100 Lister Avenue Newark, New Jersey 07105 Phone (201) 465-9100	SCA

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PLANT CLOSURE PLAN

E. Decontamination (Part II)

Total Closure Cost $787,360

Note:

A. If test borings and/or water monitoring indicate other areas of contamination, cost of removal, disposal, shipping, etc. must be added to costs supplied above.

B. The Baltimore, Maryland plant site is operated under the effluent guidelines of the plants' NPDES permit. The plant would continue to abide by the NPDES permit requirements and effluent limitations during the entire post closure operation.

CERTIFICATE OF CLOSURE

When closure is completed, FMC must submit to the Regional Administrator (see address, page 1) certification both by the owner (FMC) and by an independent registered professional engineer that the facility has been closed in accordance with the specifications in the approved closure plan.